

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants	:	Mohamad Nourmohamadian et al.)	Group Art Unit 2185
)	
Appl. No.	:	10/655,948)	
)	
Filed	:	09/05/2003)	
)	
For	:	VIRTUAL TAPE STACKER)	
)	
Examiner	:	Campos, Yaima)	
)	

REPLY BRIEF

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22213-1450

Dear Sir:

Appellant is replying herein to the Examiner's Answer mailed 04/17/2008.

1. "Loading" Is Erroneously Equated With "Writing"

A conventional tape library provides a host computer with a significant amount of data storage in the form of many individual tape cartridges (tape volumes). A tape library has one or more tape drives and a rack that stores tape cartridges in slots. The tape drive accepts magnetic tape cartridges (tape volumes) that are loaded and unloaded from the rack by a robotic arm. The host computer specifies which tape cartridges the robotic arm is to load into the tape drive.

A conventional sequential stacker is a specific type of tape library that automatically loads tape cartridges between the tape drive and the tape cartridge rack in a predetermined sequential order. This autoloading occurs in response to an eject command from the host computer. The host computer need not specifically identify

each tape cartridge in the rack. A sequential stacker is well-suited for automatic data back-up and retrieval applications.

U.S. 5,455,926 (Keele) describes an optical disk storage system that emulates a conventional tape library. Col. 17, lines 18-22. The Keele storage system has a robotic arm that loads and unloads optical disks between a jukebox and optical disk drives. Col. 23, lines 19-21; Figure 1. The difference between Keele and a conventional tape library is that data is physically stored on optical disks as opposed to magnetic tape cartridges. However, the data stored on the optical disks is in the form of virtual tape volumes. Col. 21, lines 19-20.

U.S. 2004/0098244 (Dailey) describes a storage system that also emulates a conventional tape library. Paragraph [0078]. The Dailey storage system has a robotic arm that loads and unloads disk drive cartridges between a storage rack and a disk drive. Figure 10. The disk drive cartridges themselves emulate tape cartridges. Paragraph [0078].

Both Keele and Dailey disclose data storage systems having robotic arms that physically move either an optical disk or a disk drive cartridge between a storage rack and a drive. Neither Keele nor Dailey describe a virtual mechanism that emulates a robotic arm in loading and loading virtual tape cartridges (volumes) between a virtual storage rack and a virtual tape drive. More importantly, neither Keele nor Dailey describe an automatic loading (autoloading) mechanism for implementing a sequential stacker. That is, neither Keele nor Dailey describe a virtual tape library or a virtual sequential stacker.

Appellant's application describes a virtual tape controller that provides communications between a conventional disk drive 330 and a host computer 110. Figure 4. There is no physical robotic arm or physical storage rack. Thus, unlike Keele and Dailey, there is no physical loading and unloading of physical storage media between a storage rack and a drive. Instead, Appellant's virtual tape controller 400 (Figure 4) emulates tape volumes 500 (Figures 5A-C) on the disk drive. These virtual tape volumes are virtually loaded and unloaded into a virtual tape drive, but appear to the host computer as if a robotic arm was physically moving tape cartridges between a physical rack and a physical tape drive. Figure 8B. Further, this virtual loading and

unloading mechanism emulates a sequential stacker, in that the virtual loads are automatically implemented on a predetermined sequence of virtual tape volumes with each eject command from the host computer. Paragraphs [0033]-[0034]; Figures 8A-B.

In rejecting the Appellant's claims via Keele, the Examiner confuses the loading and unloading of physical storage media, i.e. optical disks, between a storage rack and an optical disk drive with the writing and reading of data to and from optical disks. Further, the Examiner confuses Keele's physical storage media (optical disks) loaded and unloaded into physical devices (optical disk drives) with Appellant's claimed virtual tape volumes loaded and unloaded into virtual tape drives, i.e. no robotic arm moving physical media. These erroneous assertions of equivalence between writing data onto an optical disk media and loading virtual tape volumes into a virtual tape drive are identified on a claim by claim basis below.

2. There Is No Properly Asserted 35 USC §102 Rejection

Claim 16

Claim 16 is rejected based upon erroneously equating the writing of a virtual tape volume to optical disk and the sequential loading of a virtual tape volume into a virtual tape drive as claimed. "These sectors can be written and read sequentially (*therefore, as virtual tapes are written on optical disks, they are sequentially loaded*). Answer page 21, lines 14-16, emphasis added.

Further, the rejection of claim 16 is premised upon an erroneously-stated equivalence between an optical disk and an optical disk drive. An optical disk drive, after all, reads and writes data to and from an optical disk. "Appellant should note that as virtual tapes are written sequentially on optical disks which are interpreted as a virtual drive, this comprises 'a sequential order for loading the virtual tape volumes into the virtual drive' as required by claim 16." Answer, page 22, lines 6-8, emphasis added.

Claim 17

Claim 17 is rejected based upon erroneously equating pointers to virtual tapes stored on disk in sequential order (as in Keele) with accessing pointers to determine the next consecutive virtual tape volume to load into the virtual tape drive (as claimed).

"Keele also illustrates 'Tape directory' having tapes stored in sequential order . . ."

Answer page 26, lines 5-6; "[T]herefore, any virtual tape is loaded by referring to tape directory (which stores a sequence of virtual tapes), including a next consecutive virtual tape."; Answer, page 26, lines 16-18.

Claim 18

Claim 18, too, is rejected by confusing the disparate actions of writing data and loading a virtual tape volume into a virtual tape drive. "This can be accomplished by copying existing data from tape to optical storage . . . (*thereby loading physical tape volumes on optical drive*). . . ." Answer page 27, lines 5-7.

Claim 19

Claim 19 is also rejected by erroneously equating reading/writing and loading. "[T]herefore, as Keele discloses sequentially writing tape directory having pointers to tape maps, Keele discloses accessing/loading pointers that define a sequential order for loading/writing virtual tape volumes into the virtual tape drive." Answer page 28, lines 10-13.

Claim 20

Similarly, claim 20 is rejected by once again confusing reading/writing with loading. "MOST controller accesses/reads tape directory . . . to determine the next sequentially consecutive virtual tape volume [to load] . . . since optical disks are written sequentially" Answer page 29, lines 4-7.

Claims 21-23

In the Examiner's Answer, arguments with respect to claims 21-23 are not specifically addressed. See Answer page 29, lines 8-19.

Claim 24

Claim 24 is rejected by again confusing writing data with loading a virtual volume into a virtual tape drive. "This can be accomplished by copying existing data from tape to optical storage . . . (*thereby loading physical tape volumes on optical drives*) . . ."
Answer page 30, lines 11-12.

3. There Is No Properly Asserted 35 USC §103(a) Rejection

The Examiner's Answer provides the first explanation of the asserted relevance of Dailey. However, the combination of Keele and Dailey continues the confusion between writing (recording) and loading (access order) as one in the same operation. "Therefore, the system described by Dailey discloses a tape drive emulator that contains . . . (physical volumes) and . . . (logical tape volumes) all stored within the same logical storage areas . . . in sequential order." Answer page 31, lines 12-17. "[T]herefore, disclosing emulation/virtual/logical areas in a non-tape device used to record information/virtual tapes, such that a last virtual tape volume is previous to a physical tape volume in an access order . . ." Answer page 32, lines 2-4.

Appl. No. : 10/655,948
Filed : 09/05/2003

Other points raised in the Examiner's Answer are already addressed in Appellant's Appeal Brief dated 01/13/2008. For the reasons set forth above and those stated in Appellant's Appeal Brief, the Board is respectfully requested to reverse the final rejections of all of appealed Claims 16-24.

Respectfully submitted,

LAW OFFICE OF GLENN R. SMITH

Dated: June 15, 2008

By: 

Glenn R. Smith, Esq.
Registration No. 38,308
Attorney of Record
28626 Brookhill Road
Trabuco Canyon, CA 92679-1163
Telephone/Fax: (949) 709-7164